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EPA

Permeable Reactive Barriers Action Team

RTDF

Remediation Technologies Development Forum

Current RTDF Action Teams

- Bioremediation Consortium
- IINERT Soil-Metals Action Team
- Permeable Reactive Barriers Action Team
- Phytoremediation of Organics Action Team
- Sediments Remediation Action Team

The Permeable Reactive Barriers Action Team was established in March 1995 as one of the seven Action Teams under the Remediation Technologies Development Forum (RTDF). The RTDF was created by the U.S. Environmental Protection Agency (EPA) in 1992 to foster collaboration between the public and private sectors in finding innovative solutions to mutual hazardous waste problems. The Action Team has met to discuss ongoing research, to identify development needs not currently being addressed, to identify and promote the funding of priority research needs to advance the acceptance of the technology, and to develop plans for collaborative field studies.

The Permeable Reactive Barrier

A permeable reactive barrier is a passive in situ treatment zone of reactive material that degrades or immobilizes contaminants as ground water flows through it. Permeable treatment walls are installed as permanent, semi-permanent, or replaceable units across the flow path of a contaminant plume. Natural gradients transport contaminants through strategically placed treatment media. The media degrade, sorb, precipitate, or remove chlorinated solvents, metals, radionuclides, and other pollutants. These barriers may contain reactants for degrading volatile organics, chelators for immobilizing metals, nutrients and oxygen for microorganisms to enhance bioremedi tion, or other agents.

Degradation barriers facilitate reactions that break down contaminants in the plume into harmless byproducts. Precipitation barriers react with contaminants to form insoluble products that remain in the barrier as ground water continues to flow through. Sorption barriers adsorb or chelate contaminants.

The Action Team's Mission

The mission of the Permeable Reactive Barriers Action Team is to accelerate the development of cost-effective permeable barrier technologies. The Action Team undertakes development and evaluation efforts needed to achieve public and regulatory acceptance of this technology. The efforts focus on:

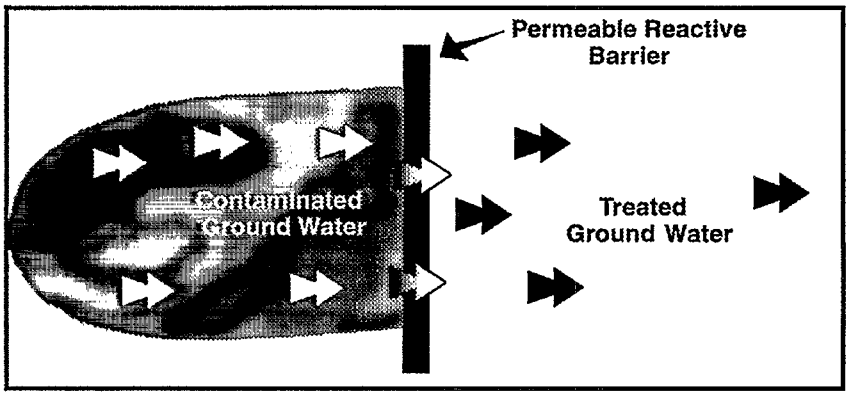
- Defining the hydraulics, geochemistry, and reactions that occur in the media and aquifers
- Demonstrating and validating the technology's effectiveness
- Developing protocols, guidance, and issue papers on design and effective implementation
- Documenting effective emplacement techniques and configurations (engineering design and constructability)
- Conducting an economic analysis of treatment cost

Accomplishments

Action Team members assisted with the design of the U.S. Air Force study, entitled "Catalytic In Situ Treatment of Chlorinated Solvents," and field work for the pilot-scale demonstration at the Area 5 site, Dover Air Force Base, Delaware. The Action Team also is actively involved in research and technology evaluation activities at the U.S. Coast Guard (USCG) site near Elizabeth City, North Carolina.

The Action Team, in cooperation with EPA's Office of Research and Development, published "Permeable Reactive Barrier Technologies for Contaminant Remediation" in 1998. The document provides the most recent information on permeable reactive barrier (PRB) technologies. The document is available on the Team's home page on the RTDF World Wide Web site.

Conceptual Configuration of Permeable Barrier System



Also in 1998, the Action Team prepared a status report on the use of permeable reactive barriers (PRBs) for ground-water remediation in the United States, Canada, and selected locations abroad. The report, available on the Team's home page on the RTDF Web site, includes profiles of about 30 ongoing and completed pilot- and full-scale PRB demonstrations and full-scale installations and a searchable bibliography of PRB-related articles and publications.

The Action Team's Plans

The Action Team, in partnership with the Interstate Technology Regulatory Cooperation (ITRC) Permeable Barriers Working Group, has developed a training course and manual to assist regulatory professionals in overseeing the design, implementation, and monitoring of ground-water remedies that involve the deployment of permeable reactive barriers (PRBs). The course will be offered in each EPA Region in 1999 and 2000.

The Action Team's Steering Committee has launched a coordinated research effort focusing on the long-term performance of PRB's (i.e. how long will they work), the major issue restricting further acceptance and deployment of this technology. The project will involve use of common techniques and monitoring approaches at selected PRB sites, collection and sharing of comparable data about PRB performance at each site over time, and development of peer-reviewed final reports on project milestones.

Action Team Members

The Action Team includes representatives from industry, government, and academic organizations, such as the following:

Industry

DuPont Company
EnviroMetal Technologies
EnviroSources
General Electric
Geomatrix
In Situ Barriers
MacMarcus Resources

Government

U.S. Air Force
U.S. Army Corps of Engineers
U.S. Department of Energy
U.S. Environmental Protection Agency
U.S. Geological Survey

Academia

University of Waterloo

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Would You Like More Information?

For more information on the Permeable Reactive Barriers Action Team, please contact the Team Co-chairs:

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For more information on the RTDF or other Action Teams, please visit the RTDF World Wide Web site at www.rtdf.org or contact:

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